

(2) Land and Building Factors

Verizon inappropriately applies a FLC factor to the land and building factor. Verizon applies its FLC factor to the switch investment included in the denominator of the land and building ratio, thus reducing the denominator and increasing the resultant ratio. Verizon claims the FLC factor is reasonable because switch costs will decline in the forward-looking environment, and application of a land and building factor based on the existing relationship of land and building investment to switch investment will understate forward-looking land and building investment. Verizon Exh. 122 (Verizon Recurring Cost Panel Surreb.) at 52. In a forward-looking network, however, switch equipment and remote terminals will occupy less space than in Verizon's embedded network, and as a result land and building investment will decrease. Use of a FLC factor assumes that land and building expenses will remain constant in a forward-looking network.

Verizon argues that if the FLC factor is removed, then a CC/BC factor must be applied. *Id.* at 51. Again, Verizon's logic is flawed; the land and building investment in the embedded network reflects older buildings built to accommodate oversized and outdated analog switches. Applying a CC/BC ratio to these embedded investments without a corresponding downward sizing adjustment will overstate forward-looking land and building investment.

(3) Y2K Expenses

Verizon's 1999 operating expenses included a one-time expenditure of **BEGIN VERIZON PROPRIETARY *** *** END VERIZON PROPRIETARY** for expenses related to Y2K. That expenditure is not one that will occur annually in a forward-looking network and should therefore be excluded. AT&T/WCOM Exh.

argues that if CC/BC ratios are applied, the FLC factor will need to be adjusted accordingly to ensure expenses are recovered at their embedded levels. Verizon's arguments against use of a CC/BC ratio in the absence of a FLC factor are simply efforts to promote the use of a FLC factor and thereby frustrate the determination of forward-looking costs.

12 (AT&T/WorldCom Recurring Cost Panel Reb.) at 92; Tr. 3826-27 (Minion). Verizon acknowledges that Y2K expenses were incurred but asserts that its 1999 Y2K expenditures crowded out other expenses in 1999 and suggests that its expenses would have been the same in 1999 even without the Y2K expenditure.¹⁰⁸ Verizon Exh. 122 (Verizon Recurring Cost Panel Surreb.) As evidence, Verizon asserts that its 2000 operating expenses were higher than its 1999 expenses. *Id.* at 40.

But it is Verizon that chose 1999 as the base year, Tr. 3824 (Minion), and Verizon that chose to provide back-up data for 1999, not 2000. *Id.* at 3825. AT&T and WorldCom have not been provided the necessary 2000 expense data to determine whether the 2000 expenses included one-time changes that would not exist in a forward-looking network (Tr. 3828-29 (Minion)) or whether they include expenses that have been inefficiently incurred. The 1999 expenses included the Y2K expenses that clearly are not forward-looking. Indeed, in his recommended decision in New York, Judge Linsider agreed with AT&T and WorldCom that Y2K expenses should be removed. Tr. 3829 (Minion).

(4) Advertising Expenses

Verizon's cost study improperly attempts to charge CLECs for Verizon's *retail* advertising. AT&T/WCOM Exh. 12 (AT&T/WorldCom Recurring Cost Panel Reb.) at 93. In response, Verizon contends that its retail advertising expenses are a surrogate for wholesale advertising expenses that would exist in a forward-looking network. Tr. 3830 (Minion). Indeed, Mr. Minion suggested that in the future "I would be very surprised if James Earl Jones was not on TV advertising UNEs." Tr. 3830-31 (Minion).

¹⁰⁸ Even if Verizon were correct that Y2K expenses crowded out other expenses, this would suggest that the other expenses were unnecessary. Thus, it would remain the case that forward-looking expenses should be calculated after removing Y2K expenses.

That is absurd. Verizon admits that it does almost no wholesale advertising today and offers no evidence that wholesale advertising would likely increase significantly – let alone approximate the level and expense of retail advertising. Verizon offers a single example of a wholesale advertising campaign directed at the public -- the “Intel inside” advertisements. Verizon Exh. 122 (Verizon Recurring Cost Panel Surreb.) at 43. But this example is inapposite – Intel is not a retailer whose advertising campaign on behalf of wholesale products could help its retail competitors. In any event, it should be the choice of a CLEC whether – and to what extent – it wants to advertise. A CLEC should not be forced to pay Verizon to advertise for it through an advertising campaign directed at the CLEC’s customers.

With respect to advertising directed at the CLECs themselves, the CLECs are knowledgeable consumers and will purchase based on price, not advertising. Indeed, advertising will make it less likely that CLECs purchase Verizon UNE elements because such advertising raises the UNE prices. Clearly, there will be no expensive mass media advertising to market UNEs to CLECs.

(5) Merger Savings

Verizon convinced regulators to approve the Bell Atlantic/NYNEX and Verizon/GTE mergers in part by describing efficiencies it anticipated would result from those mergers. Verizon included such savings in the cost models it presented in New York, and Judge Linsider’s recommended decision included such savings. Tr. 3835 (Minion). But Verizon did not include any projected savings from its mergers in its Virginia cost models.¹⁰⁹ AT&T/WCOM Exh. 12 (AT&T/WorldCom Recurring Cost Panel Reb.) at 87- 88; AT&T/WCOM Exh. 11 (Murray Reb.) at 37-38. In their restatement of Verizon’s studies, AT&T and WorldCom included the merger savings that Verizon proposed in the New York

¹⁰⁹ Verizon also included expenses associated with the mergers in its cost calculations. WorldCom Ex. 112; Tr. 3901-04 (Minion).

proceeding (WorldCom Ex. 113) – a combined 2.6% reduction in the joint and common cost factor.

In response, Verizon contends that it implicitly incorporated merger savings through its productivity adjustments. Verizon Exh. 122 (Verizon Recurring Cost Panel Surreb.) at 47-48. But, as discussed above, Verizon’s productivity adjustments are based on labor productivity gains in its embedded network and do not include any additional productivity gains from the mergers. Moreover, in New York, Verizon included merger savings in its cost models despite inclusion of *greater* productivity adjustments than it proposes here. Tr. 3835 (Minion).

Verizon next argues that AT&T and WorldCom cannot use the New York savings in any cost restatement because Verizon’s New York filing “also included an approximation for the costs associated with ongoing reorganizations of the workforce.” Verizon Exh. 122 (Verizon Recurring Cost Panel Surreb.) at 49. But Judge Linsider rejected these costs (Tr. 3835 (Minion)), and Verizon provides no estimate of any such costs in this proceeding. In any event, as noted above, Verizon already includes expenses associated with the mergers in its cost calculations.

(6) Nonrecurring and Other Support Factor Adjustments

In their restatement of Verizon’s costs using Verizon’s cost Model, AT&T and WorldCom added some costs that are appropriately recovered as recurring costs, after subtracting these costs from Verizon’s non-recurring cost model. AT&T/WCOM Exh. 12 (AT&T/WorldCom Recurring Cost Panel Reb.) at 93-94.

F. Loop Costs

The Synthesis Model calculates loop costs by determining how an efficient network would best be constructed. It does not take as given the routes, utilization levels, or technology mix in Verizon’s embedded network. By contrast, Verizon’s models begin with its

embedded network – or in many instances its network as it existed in the early and mid-1990s. Verizon attempts to make the Models forward-looking by changing the technology mix to match the expected mix of Verizon’s purchases over the next three years. However, the technology mix Verizon expects to purchase in the next three years is not a forward-looking mix because it is significantly constrained by the network Verizon already has in place. Moreover, changing the technology mix is only one of the many changes needed to make the Models forward-looking. As this Commission has explained:

While we recognize that certain factors such as terrain, road networks, and customer locations are fixed, the design of the existing networks under these conditions may not represent the least-cost, most efficient design in some cases. . . . Existing incumbent LEC plant is not likely to reflect forward-looking technology or design choices. Instead, incumbent LECs’ existing plant will tend to reflect choices made at a time when different technology options existed or when the relative cost of equipment to labor may have been different than it is today. Incumbent LECs’ existing plant also was designed and built in a monopoly environment, and therefore may not reflect the economic choices faced by an efficient provider in a competitive market.

Universal Service Fifth Order ¶ 66. *See also* Universal Service Tenth Order ¶ 63.

This section of the brief discusses loop modeling and associated input issues. In some instances, a particular loop input may be used in different ways in the Synthesis Model and Verizon’s models, and insight can be gained into input issues by discussing them back-to-back for the two models. Given the different loop inputs, AT&T and WorldCom have presented a restated version of Verizon’s cost models using appropriate inputs.

1. Line counts

a. Line counts in the Synthesis Model

In calculating costs per line, the Synthesis Model spreads costs over a projected line count for mid-2002. This 2002 line count in the middle of the three-year planning period is used so that Verizon does not overrecover its costs.¹¹⁰ Verizon does not dispute the appropriateness of using a mid-2002 line count. Verizon claims, however, that AT&T and WorldCom overestimate the number of lines in mid-2002 because some of the increase in ARMIS special access lines in 2000 resulted from a reporting change rather than line growth. Verizon Exh. 109 (Tardiff Reb.) at 29; Verizon Exh. 108 (Murphy Reb.) at 30, 114. Verizon's claim is without merit.

After Verizon raised the ARMIS special access line reporting changes, AT&T and WorldCom adjusted the Synthesis Model based on discovery responses to reduce the DS-0 equivalents in the Synthesis Model from 2.8 to 2.1 million. AT&T/WCOM Exh. 14 (Pitkin Surreb.) at 72. This number is actually substantially understated, as it does not include all non-switched lines. Verizon made clear in discovery that ARMIS data do not include all non-switched lines and that, when all non-switched lines are included, Verizon has forecasted approximately **BEGIN VERIZON PROPRIETARY *** *** END VERIZON PROPRIETARY** DS-0s for 2002. Rather than understating costs, as Verizon suggests, the line count used by AT&T and WorldCom substantially overstates costs.

¹¹⁰ To take a simple example, if Verizon had 1 million lines in 2001, 2 million lines in 2002 and 3 million lines in 2003, and Verizon's costs were divided by 1 million lines to determine the cost per line for the three-year period, Verizon would recover twice its costs over the three-year period. For similar reasons, in calculating costs for USF purposes, the Commission has emphasized the need to update line count data frequently. *See* Universal Service 12/18/01 Order (explaining that non-rural support amounts will continue to be adjusted each quarter to account for growth; as the Virginia cost model will not be adjusted each quarter, line growth must be accounted for in advance).

Verizon also contends that the growth in line counts would not all occur at existing customer locations, as assumed by the Synthesis Model, Verizon Exh. 108 (Tardiff Reb.) at 30; Verizon Exh. 109 (Murphy Reb.) at 116, and would be geographically concentrated given the growth in special access lines. Verizon Exh. 108 (Tardiff Reb.) at 30; Verizon Exh. 109 (Murphy Reb.) at 33. This complaint is without merit. The original data significantly *overstated* the number of customer locations because the model used the maximum number of locations from two different data sources and treated every household and business as a separate location, without taking into account the presence of many customers in high rise buildings. AT&T/WCOM Exh. 14P (Pitkin Surreb.) at 61, Tr. 4404 (Pitkin). This undercuts any concern about the failure to update the number of customer locations. Moreover, Verizon's own cost models also presume that growth in line counts has all occurred at existing locations, AT&T/WCOM Exh. 15P (Baranowski Surreb.) at 11, and this Commission has done the same. See Universal Service 12/18/01 Order.

b. Line Counts in Verizon's Model

In calculating costs per line, Verizon uses line information from 2001 and does not make any adjustments to account for increased demand over the three-year planning period (much less over a period of time sufficient to use up the substantial spare capacity it has built into its network to account for growth). To take account of this growth, AT&T and WorldCom adjusted Verizon's studies to account for the three percent annual growth that occurs on average in Verizon's network and the resulting decline in average cost per line that is associated with such growth over the planning period. AT&T/WCOM Exh. 12 (AT&T/WorldCom Recurring Cost Panel Reb.) at 79. Verizon nowhere argues that this adjustment is inappropriate.

Moreover, in its initial filing, Verizon did not even spread costs over all the 2001 lines. After reviewing AT&T and WorldCom's rebuttal testimony, Verizon acknowledged that it

had excluded approximately 300,000 loops from its loop study and restated its loop costs in its surrebuttal testimony. Verizon Exh. 122 (Verizon Recurring Cost Panel Surreb.) at 74-76. Not surprisingly, adding these lines to the Verizon cost study decreased the average cost per loop. AT&T and WorldCom's Panel Rebuttal restatement of loop costs was based on Verizon's original loop count included with its July 2 cost model. Because the AT&T and WorldCom restatement did not reflect the increased number of loops,¹¹¹ its restated costs were actually overstated. Because Verizon did not produce the electronic files supporting its new line counts and restated loop costs until after the loop panels appeared at the FCC hearings, AT&T and WorldCom were unable to update the restatement of Verizon's studies.¹¹² AT&T and WorldCom have now had an opportunity to review Verizon's new electronic files and to make the changes identified in the Panel Rebuttal testimony to the updated Verizon cost studies. The updated restatement results are set forth in Appendix 1 to this brief.

2. DS-0 equivalents of DS-3 and DS-1

Verizon's network includes not only DS-0 services but also DS-1 services, DS-3 services, and other higher bandwidth services. Accordingly, a method is needed to allocate shared costs in the network across these different services. The Synthesis Model allocates costs based on DS-0 equivalents, which is the same method used by the FCC for allocating costs in its

¹¹¹ Nor was it possible for AT&T and WorldCom to actually change the number of loops within the Verizon model. Only Verizon has access to modify the line counts in its model.

¹¹² Verizon did provide electronic files supporting the average two-wire loop rate of \$22.38 identified in Appendix I to its Panel Surrebuttal Testimony on October 25, two business days before the loop hearings. Tr. 4039-40 (Sanford). However, those files contained a double counting of both Verizon's original line counts and its new line counts. On November 1, 2001, Verizon produced a new set of electronic files that corrected the double counting of lines and produced a statewide average two-wire loop rate of \$22.33.

USF calculations.¹¹³ It is important that the Commission use a consistent standard to allocate shared costs to prevent distortion of costs and eliminate arbitrage opportunities. AT&T/WCOM Exh. 14 (Pitkin Surreb.) at 45-47. And it is reasonable to conclude that services that require more DS-0 equivalents have higher costs. *Universal Service Tenth Order* ¶ 392.

Verizon criticizes the use of DS-0 equivalents in the Synthesis Model to allocate costs and argues that costs should be allocated based on physical pairs. Having argued in favor of using physical pairs, Verizon refused to provide data on physical pairs to AT&T and WorldCom in discovery. AT&T/WCOM Exh. 12 (Pitkin Surreb.) at 48 & n. 42; Tr. 4520-21 (Pitkin). Verizon cannot have it both ways. If it believes that physical pairs are the appropriate allocator for shared costs, then it cannot refuse to provide data at the heart of that allocation issue. Furthermore, Verizon's advocacy of allocation of costs on a physical pair basis is nothing more than a litigation argument, as Verizon itself uses DS-0 equivalents in its own cost study to allocate the cost of fiber, poles and conduit. ATT/WCOM Exh. 14P (Pitkin Surreb.) at 47; ATT/WCOM Exh. 15P (Baranowski Surreb.) at 7-8. Moreover, the use of DS-0 equivalents for allocating investments is commonplace in the industry, and BellSouth's witnesses have testified that it is appropriate.¹¹⁴

Verizon acts as if use of DS-0 equivalents understates costs, but in fact the issue relates only to cost allocation. Tr. 44603-04 (Pitkin). If costs were allocated on a physical pair

¹¹³ The Synthesis Model is quite conservative in its use of DS-0 equivalents. Unlike the FCC's version of the model, the Synthesis Model calculates investment in loop plant by constructing an individual loop for each DS-0 equivalent reported in ARMIS.

¹¹⁴ See *Investigation into Pricing of Unbundled Network Elements*, Docket No. 990649-TP, Final Order on Rates for Unbundled Network Elements Provided by BellSouth, Order No. PSC-01-1181-FOF-TP, May 25, 2001, at 135 (Fla. Pub. Serv. Commn)(approving BellSouth recommendation to use DS0 equivalents); *In re Final Deaveraging of BellSouth Telecommunications, Inc., UNE Rates pursuant to FCC CC 96-45 9th Report and Order on 18th Order on Reconsideration*, Docket No. U-24714-A, Sept. 19, 2001 (Louisiana Pub. Serv. Commn Ex Parte) (adopting use of DS-0 equivalents).

basis, the costs of DS-0 services would increase but the cost of higher bandwidth services would decrease correspondingly. ATT/WCOM Exh. 12 (Pitkin Surreb.) at 46-47.

Moreover, AT&T and WorldCom did not build into the Synthesis Model 24 DS-0s for every DS-1 and did not allocate costs on that basis. Based on the only data Verizon provided, AT&T and WorldCom had available the number of DS-0s associated with POTs lines in ARMIS, the number of DS-0s associated with special access lines, and a separate number of physical private line loops. The reported number of DS-0s associated with special access lines translated into a ratio of 8 DS-0 equivalents per physical line. AT&T/WCOM Exh. 1 (Pitkin Dir.) at 25. Thus, in order to recover the investment in the Synthesis Model, AT&T and WorldCom calculated DS-1 and DS-3 costs using reasonable assumptions about relationships between DS-1s and DS-3s so that the ratio of 8 DS-0s per physical line was maintained. *Id.* at 25. During the hearing, Mr. Pitkin showed why these assumptions were necessary and why an assumption of 24 DS-0s per DS-1, given the inputs used in the Synthesis Model, would have led to an over-recovery of the investment. Tr. 4479-86, 4525-27 (Pitkin); AT&T Ex. 129. Moreover, the relationships used in calculating DS-1 and DS-3 costs are validated by Verizon's own models. AT&T/WCOM Exh. 14 (Pitkin Surreb) at 51.

3. Synthesis Model Road Factor

AT&T and WorldCom have reduced the road factor in the Synthesis Model from 1.0 to 0.9 to correct for the Synthesis Model's use of surrogate customer location data that overstates dispersion and inflates the amount of cable and structure needed. AT&T/WCOM Exh. 1 (Pitkin Dir.) at 21; Tr. 4563-66 (Pitkin). In the *Universal Service Tenth Order*, the Commission rejected a downward adjustment in the road factor because there was no reliable source to compare actual customer locations with surrogate locations and thus to determine whether the road surrogate algorithm overstated customer dispersion. *Id.* at 46; 82.

Subsequently, staff of the Kansas Corporation Commission conducted just such an evaluation and determined that the cable quantities produced by the Synthesis Model were greater than those in the SBC embedded network. AT&T/WCOM Exh. 1 (Pitkin Dir.) at 21. The Kansas Commission therefore reduced the distribution distance produced by the Synthesis Model by 15%. In addition, BellSouth's new cost model, which is based on geocoded data, generates about *half* the distribution route miles of the FCC's default model when modeling the same network. *Id.* Thus, there is no longer any doubt that use of a road factor of 1.0 in the Synthesis Model overstates dispersion.

Verizon responds that in Virginia, ARMIS sheath distances are greater than the distances in the FCC's default model. Verizon Ex. 109 (Murphy Reb.) at 102-03. However, a comparison of ARMIS sheath distances with route distances in the Synthesis Model is meaningless. In Verizon's embedded network, Verizon is likely to have duplicative sheaths along many routes as a result of plant reinforcement and use of copper and fiber on the same route. AT&T/WCOM Exh. 14P (Pitkin Surreb.) at 57-58; AT&T/WCOM Exh. 18P (Riolo Surreb.) at 19-20. Moreover, a TELRIC model should produce significantly less sheath distance than an embedded network because the model designs routes efficiently, rather than building them piecemeal to address incremental demand as it develops. AT&T/WCOM Exh. 14P (Pitkin Surreb.) at 57.

In contrast to Verizon's comparison of sheath distances in ARMIS, the Kansas staff did a detailed evaluation of sheath feet in specific wire centers and concluded that use of a road factor of 1.0 overstates the amount of cable and structure needed. AT&T/WCOM Exh. 14P (Pitkin Surreb.) at 58. And use of BellSouth's model shows that a TELRIC model that uses geocoded data produces far less cable and structure than would be produced using a road factor

of 1.0. The downward adjustment made by AT&T and WorldCom is conservative in light of the existing data.

4. Maximum loop length

Verizon—which uses a maximum copper loop length of 12,000 feet in its cost studies—contends that the Synthesis Model, by permitting maximum copper loop lengths in excess of 12,000 feet beyond the feeder/distribution interface, violates the Carrier Serving Area (“CSA”) design standards and constructs a network incapable of providing advanced services. Verizon Exh. 109 (Murphy Reb.) at 19. Tr. 4053, 4400 (Murphy). Indeed, Verizon asserts that “[a]ny deviation from these CSA standards could prevent the delivery of these services and would introduce inefficiencies in the incumbent carrier’s operations.” Verizon Exh. 109 (Murphy Reb.) at 19 (emphasis added). Verizon’s analysis is fundamentally flawed in several important respects.

First, Verizon concedes that the CSA 12,000 foot constraint is not an “absolute ceiling.” Tr. 4053-4054 (Murphy). Indeed, even the flexible CSA standard allows some loops to exceed 12,000 feet. AT&T/WCOM Exh. 18P (Riolo Surreb.) at 3.¹¹⁵

Second, Verizon’s argument is nothing more than a rehash of arguments that this Commission has previously considered and rejected. AT&T/WCOM Exh. 14P (Pitkin Surreb.) at 32-33; AT&T/WCOM Exh. 18P (Riolo Surreb.) at 3. In this regard, the Commission has already found that copper loops of 18,000 feet in length are appropriate for the provision of services that meet quality standards for universal service, stating:

We conclude that the federal mechanism should assume a maximum copper loop length of 18,000 feet. The record supports the finding that a platform that uses 18,000 foot loop-lengths will support at appropriate quality levels the services eligible for universal service support. Although BCPM has presented

¹¹⁵ See also AT&T Ex. 117 at D2, D3 (noting that loops in rural areas exceed CSA standards).

evidence that the provision of some, high-bandwidth advanced services may be impaired over 18,000 foot loops, we conclude that the BCPM sponsors have not presented credible evidence that the 18,000 foot level will not provide service at an appropriate level, absent the use of expensive DLC line cards. . . . We find that the public interest would not be served by burdening the federal universal service support mechanism with the additional cost necessary to support a network that is capable of delivering very advanced services, to which only a small portion of customers currently subscribe. Accordingly, we conclude that the federal mechanism should assume a maximum copper loop length of 18,000 feet.

Universal Service Fifth Order ¶ 70 (footnotes omitted). Accordingly, the use of an 18,000 foot loop is fully consistent with the Commission's previous determination.

Third, copper loops up to 18,000 feet as designed by the Synthesis Model can support advanced services. AT&T/WCOM Exh. 18P (Riolo Surreb.) at 4-5. Notably, Verizon has admitted that it "offers ISDN and DDS services in all areas of Virginia as allowed by the transmission characteristics of the plant, and that "[i]t is likely that some of these services have been provisioned in areas designed before the current CSA guidelines were in practice" AT&T/WCOM Exh. 126 (Response to AT&T/WorldCom 10-33). Thus, by Verizon's own admission, its outside plant includes loops which provide advanced services and which violate CSA standards.¹¹⁶

Furthermore, although Verizon states broadly that copper loop lengths in excess of 12,000 feet are somehow incapable of providing advanced services, Verizon has not identified and cannot identify a single loop modeled by the Synthesis Model that exceeds the so-called CSA copper loop length constraint that is incapable of supporting advanced services. See AT&T/WCOM Exh. 118 (Response to AT&T/WorldCom 10-28). Moreover, Verizon's argument regarding the Synthesis Model's violation of purported CSA standards relates to a tiny

¹¹⁶ See also Tr. 3207-3208 (Murray) (noting that Verizon's network has not been built ubiquitously to CSA standards).

fraction — fewer than 1% of the loops “constructed” by the Synthesis Model. Thus, not only is Verizon’s argument regarding the inherent limitations of the loops modeled in the Synthesis Model erroneous, but its insignificance belies Verizon’s claim that the entire network constructed by the Synthesis Model is wholly incapable of providing advanced services in a forward-looking environment. AT&T/WCOM Exh. 14P (Pitkin Surreb.) at 32-33.¹¹⁷

5. Size of Distribution Areas

Verizon claims that the Synthesis Model oversizes distribution areas by including more than 200-600 living units. Verizon Exh. 109 (Murphy Reb.) at 27-29. This criticism is without merit. As AT&T/WorldCom witness Joseph Riolo demonstrated in his surrebuttal testimony, the distribution area is flexible in the number of living units that it can contain, and there is no 600 living unit limitation. In fact, technology changes have made larger distribution areas not only feasible but also advisable depending on the size of the SAI. This fact is confirmed by Verizon’s network, which includes distribution areas that significantly exceed 600 living units. AT&T/WCOM Exh 18P (Riolo Surreb.) at 7-9.

6. Cable sizing and selection

The Synthesis Model calculates cable size based on working lines and target fill factors. Verizon does not challenge this method. In contrast, Verizon substantially underestimates cable size, and thereby overstates cable unit costs, by calculating cable size *before* applying any utilization factors. Verizon sizes metallic cable based on the average number of working lines within each wire center. Only then does Verizon increase costs by application of a distribution utilization factor or feeder utilization factor. Tr. 4211-12 (Sanford). For example, as the AT&T/WorldCom Recurring Cost Panel explained, if Verizon’s Model

¹¹⁷ See also Tr. 3207-3208 (Murray) (noting that “a relatively small percentage of loops” constructed by the Synthesis Model exceed 12,000 feet).

assumed 300 working lines in a particular distribution area, the Model would base the unit costs of cable on the cost of a 300-pair cable – even though a 600-pair cable would be used if, as Verizon posits through its distribution fill factor of less than 50%, more than 600 pairs were actually needed at the distribution area. As a result, Verizon underestimates cable size and overestimates costs. AT&T/WCOM Exh. 12P (AT&T/WorldCom Recurring Cost Panel Reb.) at 38-39.

Verizon's own surrebuttal testimony illustrates the impact of its methodology. Verizon states that it is much more efficient to install additional distribution cable in advance to provide for growth because, for example, "an increase in capacity of 100%, provisioning a 100 pair cable instead of a 50 pair cable, increases the investment by only 19%." Verizon Exh. 122 (Verizon Recurring Cost Panel Surreb.) at 123. This may be true, but not in Verizon's models. An increase in capacity of 100%, from 50 working pairs to more than 100 working and non-working pairs, increases costs by 100%, as the models establish prices as if two 50-pair cables were used.

Verizon acknowledges that if there were 300 total working pairs in a UAA, Verizon's loop study "would calculate copper distribution cable costs based on a 300-pair cable," even though there were more than 600 pairs in the UAA when non-working pairs were included. *Id.* at 99. Verizon's calculation of cable size based only on working pairs thus understates cable size. Verizon does not dispute this understatement but suggests that this error is offset by another error in its model – the failure to account for the possibility that multiple cables would be used in a particular UAA.

However, it is not AT&T and WorldCom that incorrectly assumed that a single cable would always serve a particular UAA – that is the assumption that Verizon used in its Model. Tr. 4452-53 (Baranowski). Indeed, the Synthesis Model does not make such an

assumption; it calculates how many cables would efficiently be used in a particular UAA. Tr. 4458 (Pitkin). Verizon's claim that by making this assumption it overstated cable size and offset its error in calculating cable size based only on working lines is unproven. Tr. 4457 (Baranowski). Further, that assumption is likely wrong. It is quite possible that a single cable would be used in many UAAs – or that one large cable would be used for most of the route distance served in the UAA with smaller cables used only for short distances.

Verizon's cable sizing practices are clearly irrational, and there is no evidence that its two errors offset each other.

7. Cable Unit Costs

Verizon does not question the cable unit costs used in the Synthesis Model. The cable unit costs in Verizon's studies, however, are too high. Verizon bases its cable costs on information contained in its VRUC database from 1997 to 1999. Although this information ostensibly reflects the actual cost of cable, Verizon acknowledged in its surrebuttal testimony that it used estimation techniques. Moreover, Verizon calculates the cost of cable based on three years of data, one of which appears to be entirely aberrational. Elimination of the outlier data yields more accurate cable costs.

The cable costs used in Verizon's Model do not appear to be actual cable costs but rather estimates. The price per foot is consistently 44.46 percent higher in 1998 than in 1997 across various cable sizes, which would be highly unlikely if actual cable costs were used. AT&T/WCOM Exh. 12P (AT&T/WorldCom Recurring Cost Panel Reb.) at 33. In addition, the inputs Verizon uses for cable costs show the exact same incremental increase in the cost per foot of cable from 300 to 600 pair cable and from 600 to 900-pair cable for aerial, buried and underground plant. *Id.* at 35-36. Verizon claims that it determines its total cable costs and then allocates these costs among different cable sizes and structure types based on an estimation

technique. Verizon Exh. 122 (Verizon Recurring Cost Panel Surreb.) at 87-92. But Verizon nowhere demonstrates that this estimation technique is accurate or reasonable. To the contrary, the consistent increases in cable cost across different cable sizes and structure types over the three year period suggests that the technique for allocating cable costs is inaccurate. AT&T/WCOM Exh. 12P (AT&T/WorldCom Recurring Cost Panel Reb.) at 36.

More importantly, Verizon's method of determining the *overall* cable costs is inaccurate. Verizon determines cable costs based on linear regression of cable costs in the years 1997 to 1999. Verizon Exh. 122 (Verizon Recurring Cost Panel Surreb.) at 93. But the cable costs Verizon reports for 1998 are 44.46% higher than in 1997 for underground cable, 23.3% higher than 1997 for aerial cable, and 25.2% higher for buried cable. AT&T/WCOM Exh. 12P (AT&T/WorldCom Recurring Cost Panel Reb.) at 33-34. The 1998 cable prices are also vastly more expensive than the 1999 prices. Verizon Exh. 122 (Verizon Recurring Cost Panel Surreb.) at 94. Clearly, inclusion of the 1998 data significantly distorts the results. In its restatement of Verizon's costs, AT&T and WorldCom used the 1997 prices adjusted forward to 2001.

Verizon responds that the 1997 data may have been exceptionally low, which is why it used a sample of three years. *Id.* at 93-95. But the 1997 and 1999 data are similar and much lower than the 1998 data, and Verizon made no effort to evaluate why the 1998 cable costs were so much higher than those in 1997 and 1999. Tr. 4270-71 (Sanford). Thus, it is only reasonable to presume that the 1997 and 1999 data more accurately reflect the likely cost of cable on an ongoing basis.

8. DLC Costs

a. The Assumed Mix Of DLC Technology

A new entrant employing the least cost technology would deploy exclusively GR-303 technology for DLC in its network.¹¹⁸ Verizon's own witness, Mr. Gansert, acknowledged that much, if not all, of the IDLC deployed by an entrant unconstrained by Verizon's existing switches would be GR-303. Tr. 4556 (Gansert). **[BEGIN VERIZON PROPRIETARY]**

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¹¹⁸ The efficiency of GR-303 also is apparent from the fact that "[m]ost CLECs transport the unbundled loops back to their central offices (switches) using GR-303 IDLC systems." AT&T Ex. 122, Telcordia Notes on the Networks, Oct. 2000 at 12-52. ILECs are also deploying GR-303. U.S. West and SBC began deploying GR-303 in 1998. WorldCom Ex. 116 at 5; WorldCom Ex. 117 at 8-9. **[BEGIN VERIZON PROPRIETARY]**

[END VERIZON PROPRIETARY] The ILECs have recognized the cost savings associated with GR-303. WorldCom Ex. 117 at 10.

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¹²¹ **[END VERIZON PROPRIETARY]**

While Verizon acknowledges that much of the IDLC employed by a new entrant would be GR-303 (and fails to explain why any would be TR-008),¹²² Verizon argues that a new

¹²⁰ **[BEGIN VERIZON PROPRIETARY]**

[END VERIZON PROPRIETARY]

¹²¹ Verizon states that the reason it will deploy TR-008 in its own network in Verizon East is because of startup costs associated with GR-303 that make it less efficient to use GR-303 if only a small volume of GR-303 is going to be deployed because some of Verizon's existing switches are not GR-303 compatible. Tr. 4150-52, 4158-59, 4175-76 (Gansert); Verizon Exh. 107 (Verizon Cost Panel Dir.) at 91. Mr. Gansert explained that if you are not going to supply a large amount of GR-303, it does not make sense to deploy GR-303 – especially in a world that may soon change to packet switches. “[T]o operate efficiently, you really want to deploy that operating paradigm [GR-303] across the whole universe.” Tr. 4170-71. Verizon West apparently performed a major replacement of the digital systems which, in Verizon's view, explains why Verizon West is deploying GR-303. Tr. 4172 (Gansert). All of this shows that a new entrant deploying a large number of new switches and loops would certainly choose GR-303.

Similarly, in its written testimony, Verizon's reasons for the low level of GR-303 in its models all relate to the constraints of its existing network – (1) there is no reason to replace TR-008 technology that has already been purchased; and (2) there is a need to coordinate switch and feeder deployment. Verizon Exh. 122 (Verizon Recurring Cost Panel Surreb.) at 82-83. “[T]he huge existing investment in modern digital switch ports that support TR-008 would have to be replaced and stranded to deploy the GR-303 interface widely.” Verizon Exh. 107 (Verizon Cost Panel Dir.) at 91. Verizon's critique of AT&T and WorldCom's argument for extensive deployment of GR-303 is that it assumes a scorched-node approach. Verizon Exh. 122 (Verizon Recurring Cost Panel Surreb.) at 82. Of course, that is exactly the approach that should be used to evaluate forward-looking costs.

entrant would use UDLC to provide non-switched services, ISDN, and unbundled loops.¹²³ This is incorrect. **[BEGIN VERIZON PROPRIETARY]**

[END VERIZON PROPRIETARY] Other Verizon documents, as well as documents from

¹²² Verizon's assumptions about the amount of TR-008, as compared with GR-303, in its models had nothing to do with the different functional capabilities of the technologies. Tr. 4153 (Gansert).

¹²³ Verizon acknowledges that all its switched services could be provided using GR-303. Tr. at 4147 (Gansert).

other ILECs and from Telcordia make this clear as well. *See, e.g.,* AT&T Exh. 124, *NYNEX Loop Technologies Application Guidelines*, March 1997, at 38 (GR-303 is an efficient means of providing ISDN); WorldCom Exh. 117, *GR-303 Deployment: An ILEC Perspective*, July 1998, at 10 (GR-303 supports non-switched services and ISDN). Indeed, Mr. Gansert noted that Verizon's plan in 1997 was based on the assumption "that all unbundled loops will be provided over GR-303." Tr. 4077.¹²⁴ *See also* AT&T/WCOM Exh. 12P (AT&T/WorldCom Recurring Cost Panel Reb.) at 23, 28-29; AT&T/WCOM Exh. 13 (AT&T/WorldCom on Non-Recurring Costs Panel Reb.) at 15-18 (describing technical feasibility).

While Verizon at times appears to dispute the conclusions of these documents, in the end, Verizon acknowledges that unbundling, for example, is "hypothetically possible," and Mr. Gansert was forced to admit that Mr. Riolo's diagram described unbundling using GR-303.¹²⁵ Tr. 4611-17 (Riolo, Gansert). He also stated that "[w]e never denied there was a hypothetical architecture that could be created to do electronic unbundling using GR303." Tr. 4185. **[BEGIN VERIZON PROPRIETARY]**

[END VERIZON PROPRIETARY] Thus, Verizon retreats to the position that the OSS to enable CLECs to order unbundled loops for GR-303 has not yet been developed

¹²⁴ Mr. Gansert later stated that some of these documents were describing unbundling of GR-303 using a UDLC arrangement. None of the documents say this, however. And all postulate significant cost savings from what Mr. Gansert describes as UDLC unbundling in a GR-303 environment. Thus, even if what Mr. Gansert calls unbundling of GR-303 using a UDLC arrangement were needed, there would be significant cost savings with GR-303 that are not accounted for in Verizon's critique. In any event, Mr. Gansert does not dispute that GR-303 unbundling is possible without any UDLC.

¹²⁵ GR-303 unbundling would use the Time Slot Interface ("TSI") feature. A basic description of that feature is described in a 1993 NYNEX document. AT&T Ex. 123. Methods of unbundling GR-303 have been known for years. WorldCom Ex. 116, U.S. West 1998 Presentation, at 6-7. Mr. Gansert acknowledged that these documents described methods for unbundling. Tr. 4163 (Gansert)

and that there are security concerns with enabling CLECs to access Verizon's network to perform maintenance testing functions in a GR-303 environment.¹²⁶ This, however, is to make regulatory mountains out of technical molehills. Tr. 4616 (Riolo).

An entrant constructing a new network would employ exclusively GR-303 because its economic advantages dwarf the expenditures needed to resolve the minor technical obstacles that exist – and manual workarounds could be used in the interim if needed. **[BEGIN VERIZON PROPRIETARY]**

[END VERIZON PROPRIETARY]

¹²⁶ In its surrebuttal testimony, Verizon asserts that “AT&T/WorldCom’s suggestion that IDLC unbundling could be resolved by simple OSS developments or manual ordering avoids entirely the far more significant technical issues that must be resolved before such unbundling can be provisioned at all.” Verizon Exh. 122 (Verizon Recurring Cost Panel Surreb.) at 80 n. 67. But, as noted above, Verizon acknowledges that GR-303 loops can be unbundled, and that only OSS and security issues are a concern.

In fact, NYNEX's 1997 Technical Document, concurred in by Mr. Gansert, stated that GR- 303 (then called TR-303) would likely play a key role in unbundling and that Verizon could employ TR-008 methods of unbundling (without any UDLC) until the industry developed multi-hosting capabilities for GR-303. AT&T Ex. 120 at 4. The document described three methods of unbundling using TSI with TR008 and GR-303 and described the OSS for doing so. *Id.* at 4-6. The document also described architectures for unbundling and non-switched services and stated that "[t]he additional steps required for flowing through the TSI change have been demonstrated to be technically and operationally feasible (a successful Operations "FOA" was conducted in NET in 1995). The software presently in the NYNEX Operations Systems that allow for 'flexible' TSI flow-through were put through their paces and found acceptable for operations deployment." *Id.* at 7. A diagram of the OSS was provided on page 8.

While hiding behind the claimed difficulty of developing OSS for unbundling, Verizon fails to explain why developing OSS for unbundling GR-303 loops would be difficult.¹²⁷ As the AT&T/WorldCom Cost Panel stated, there are no significant technical barriers to developing this OSS. AT&T/WCOM Exh. 12P (AT&T/WorldCom Recurring Cost Panel Reb.) at 29-30. And Verizon has not pointed to any such barriers. Indeed, since the Telecommunications Act passed in 1996, the Commission frequently has ordered ILECs to provide unbundled elements with the OSS for that unbundling. The ILECs – in cooperation with the CLECs – have been able to develop that OSS. Tr. 4615 (Riolo). The OSS for GR-303 is no more complicated – and indeed less complicated given that the OSS for ordering other UNEs has

¹²⁷ Certainly there is no need to deploy UDLC. The 1997 NYNEX document, concurred in by Mr. Gansert, states that "the TR 008 systems already in service can, if equipped with a TSI, provide the needed unbundling capabilities using a DS-1 interface. This unbundling mechanism is fully supported by Operations Systems (OSS's) and is the recommended and preferred option." AT&T Ex. 118 at 4. Telcordia also describes the use of TR-008 for unbundling without positing any limitations concerning OSS or security. AT&T Exh. 122, Telcordia Notes on the Network, Oct. 2000 at 12-56.

already been developed. In fact, Verizon has had to resolve OSS issues with respect to its back-end systems to deploy GR-303 outside the context of unbundled loops. Verizon resolved these issues once it decided to deploy GR-303. Tr. 4587 (Gansert) (stating that OSS for GR-303 had been developed for the LEC environment). Where it has decided to deploy a significant amount of GR-303 – in Verizon West – Verizon has not only resolved these difficulties but also shown the OSS works in practice. Verizon could easily develop the OSS for ordering unbundled GR-303 loops as well.

And even if fully electronic OSS could not immediately be developed, it would make sense in a reconstructed network to deploy GR-303 and use manual ordering processes for UNE loops in the interim. Tr. 4615 (Riolo). Verizon does not dispute this possibility. Indeed, when NYNEX originally determined to deploy GR-303 technology, it did so even though “[s]ome manual intervention is required until the first half of 1996 when BellCore’s SWITCH OS is available.” AT&T Ex. 123, *Telesector Resources Group Technology and Network Planning*, Dec. 29, 1993, at 9. **[BEGIN VERIZON PROPRIETARY]**

[END VERIZON PROPRIETARY]

The security issue is also a red herring. In theory, the security concern is that if competitors have access to Verizon’s network to test unbundled loops for maintenance and other purposes and these loops are concentrated with other loops, then competitors could use their access to switch customers to their network. Moreover, there may be technical difficulties in enabling multiple carriers to use their OSS to monitor alarms, conduct testing, *etc.* In essence, this is a restatement of the need to develop OSS that will work in a multi-carrier environment. But similar concerns have existed with other technologies and have been readily resolved. Again, Verizon has acknowledged facing security concerns in deploying GR-303 for loops used

for retail customers in Verizon West and has resolved those concerns. Tr. 4166-68 (Gansert). Moreover, to the extent that competitors' access to the ILECs' network to perform maintenance functions is the difficulty, Verizon could simply charge CLECs to perform these functions for them.¹²⁸ Tr. 4615-16 (Riolo). This would still be far more efficient than deploying any UDLC in the network.

The real issue is that, because Verizon has chosen to deploy relatively little GR-303 in its existing network—due to the technological constraints of its embedded switch investment—Verizon has lacked the incentive to work with vendors on GR-303. AT&T/WCOM Exh. 12P (AT&T/WorldCom Recurring Cost Panel Reb.) at 29-30. This is especially true with respect to the OSS and security issues that would be useful in supporting GR-303 unbundling. Indeed, so long as Verizon is able to argue for higher UNE prices on the theory that GR-303 unbundling is not yet available, it has every incentive *not* to develop the OSS and security that would support such unbundling.¹²⁹ Verizon should not be allowed to profit from this approach.

Contrary to Verizon's suggestion, Verizon Exh. 122 (Verizon Recurring Cost Panel Surreb.) at 81, the Commission's requirement that costs be based on the most efficient technology commercially available today does not counsel a different result. The most efficient

¹²⁸ Mr. Gansert was unable to identify any security concerns an ILEC would face with the use of GR-303 for unbundling if CLECs were not given access to the virtual interface groups in the system. The only concerns he identified were ones that Verizon would face even in the absence of unbundling and that have not precluded Verizon from deploying GR-303 in Verizon West. Tr. 4166-68 (Gansert).

¹²⁹ In its surrebuttal testimony, Verizon states that it provided a price quote to WorldCom for completion of the necessary technical work for unbundling loops with GR-303. Verizon Exh. 122 (Verizon Recurring Cost Panel Surreb.) at 79-80. This demonstrates that Verizon knows that any technical issues can be resolved for a price, and Verizon does not even say that the price would be particularly high. The fact that WorldCom did not take Verizon up on its offer in 1999 – at a time when Verizon had not deployed any significant amount of GR-303 in its network merely shows that WorldCom did not want to pay any amount to develop OSS for GR-303 unbundling when almost no GR-303 existed to be unbundled as a result of Verizon's deployment of TR-008 and UDLC.